Fish & Wildlife Division

RESOURCE DATA AND SPECIES AT RISK SECTION

Status of the Sage Thrasher (*Oreoscoptes montanus*) in Alberta

Alberta Wildlife Status Report No. 53

Alberta Conservation Association

Alberta
SUSTAINABLE RESOURCE DEVELOPMENT

Status of the Sage Thrasher (*Oreoscoptes montanus*) in Alberta

Prepared for:
Alberta Sustainable Resource Development (SRD)
Alberta Conservation Association (ACA)

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This report has been reviewed, revised, and edited prior to publication.
It is an SRD/ACA working document that will be revised and updated periodically.

Alberta Wildlife Status Report No. 53

June 2004

Published By:

Alberta
SUSTAINABLE RESOURCE DEVELOPMENT
Fish & Wildlife

Alberta Conservation Association

Publication No. T/056
ISBN: 0-7785-2973-8 (Printed Edition)
ISBN: 0-7785-2974-6 (On-line Edition)
ISSN: 1206-4912 (Printed Edition)
ISSN: 1499-4682 (On-line Edition)

Series Editors: Sue Peters, Nyree Sharp and Robin Gutsell
Illustrations: Brian Huffman

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This publication may be cited as:

Alberta Sustainable Resource Development. 2004. Status of the sage thrasher (*Oreoscoptes montanus*) in Alberta. Alberta Sustainable Resource Development, Fish and Wildlife Division, and Alberta Conservation Association, Wildlife Status Report No. 53, Edmonton, AB. 23 pp.

PREFACE

Every five years, the Fish and Wildlife Division of Alberta Sustainable Resource Development reviews the general status of wildlife species in Alberta. These overviews, which have been conducted in 1991 (*The Status of Alberta Wildlife*), 1996 (*The Status of Alberta Wildlife*) and 2000 (*The General Status of Alberta Wild Species 2000*), assign individual species "ranks" that reflect the perceived level of risk to populations that occur in the province. Such designations are determined from extensive consultations with professional and amateur biologists, and from a variety of readily available sources of population data. A key objective of these reviews is to identify species that may be considered for more detailed status determinations.

The Alberta Wildlife Status Report Series is an extension of the general status exercise, and provides comprehensive current summaries of the biological status of selected wildlife species in Alberta. Priority is given to species that are *At Risk* or *May Be At Risk* in the province, that are of uncertain status (*Undetermined*), or that are considered to be at risk at a national level by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

Reports in this series are published and distributed by the Alberta Conservation Association and the Fish and Wildlife Division of Alberta Sustainable Resource Development. They are intended to provide detailed and up-to-date information that will be useful to resource professionals for managing populations of species and their habitats in the province. The reports are also designed to provide current information that will assist Alberta's Endangered Species Conservation Committee in identifying species that may be formally designated as *Endangered* or *Threatened* under Alberta's *Wildlife Act*. To achieve these goals, the reports have been authored and/or reviewed by individuals with unique local expertise in the biology and management of each species.

EXECUTIVE SUMMARY

The sage thrasher (*Oreoscoptes montanus*) is a songbird of the sagebrush-dominated grasslands whose status is currently *Undetermined* in Alberta. Information on the biology and distribution of this species in Alberta is largely anecdotal, but it has been observed most commonly in the southeastern corner of the province. In other parts of its distribution, it prefers large areas dominated by tall sagebrush and other shrubs within range that is in fair to good condition (≥ 25 % cover in climax species), with bare ground and perennial grasses making up the understorey. In Alberta, this habitat is found in the southeastern corner of the province on alluvial soil along creeks and rivers and in coulees.

The sage thrasher is a brownish-grey bird slightly smaller than a robin, boldly streaked with dark brown on its underparts. It is distinguished from the other thrashers by the combination of its shorter tail, its shorter and straighter bill, its white wing bars, and its song. It is an opportunistic ground feeder that eats mostly insects, but also berries and seeds.

The sage thrasher nests in, or occasionally under, a dense sagebrush. It lays four or five eggs that the monogamous pair will incubate for approximately 15 days. The nestlings usually fledge 11 days after hatching. Nesting of the sage thrasher has been confirmed in Alberta in 1988-1991, and 2003, but probably also occurred in 1992 and possibly in 1993. Little information is available about the productivity of this species in the province.

Details on the phenology of the sage thrasher in Alberta are very sketchy. Birds likely arrive from their winter grounds by mid-May and start breeding by mid- to late June. They likely leave for their southern migration between late August and late September.

Nesting records in the province are found south of Medicine Hat with reports of transient birds as far north as Jasper and Grande Prairie. Elsewhere, the sage thrasher is found nesting erratically in the extreme southwestern corner of Saskatchewan, in extreme south-central British Columbia and south-central Washington, central Idaho, and south-central Montana south through the Great Basin to northeastern Arizona, northern New Mexico, northern Texas, and northern Oklahoma. It winters largely south of the breeding range south to central Mexico.

The number of nesting sage thrashers in any one year in Alberta has never been greater than three pairs and appears to vary from year to year. This may in part result from the fact that suitable habitat in Alberta is disjunct by more than 400 km from the main nesting population in southwestern Montana, and that the sagebrush in Montana appears to be highly fragmented.

Across the range, Breeding Bird Survey data have shown a declining trend in sage thrasher populations in recent years. This species is most limited by loss or degradation of sagebrush habitat. In Alberta, it might be negatively affected by oil and gas development, and might be positively affected by climate change. However, much of the information on this species in the province is either absent or largely anecdotal and more information is needed to fully understand the status of the sage thrasher in Alberta.

ACKNOWLEDGEMENTS

I am grateful to the many amateur birders in the province whose birding records are contributing to our increased knowledge of bird species in Alberta. I am also thankful to the Federation of Alberta Naturalists through Philip Penner and Michael Semenchuk, the Alberta Natural Heritage Information Centre through John Rintoul, the Alberta Bird Record Committee through Richard Klauke, Environment Canada through Alan Smith, and Alberta Sustainable Resource Development through Leo Dube, for allowing the use of their data and taking the time to answer my questions. Valuable comments and information during the write-up of this report were provided by Harold Pinel, Alan Smith, Richard Klauke, Jocelyn Hudon (Provincial Museum of Alberta), Michael O'Shea (Alberta Bird Atlas Project), Dennis Baresco and Jo-Anne Reynolds (Police Point Interpretive Centre), Phil Horch, Mark Oxamitny, Bob Luterbach, John Carlson (Montana Natural Heritage Program), Dan Casey (Montana Audubon), John Taggart, Dale Eslinger and Robin Gutsell (Alberta Sustainable Resource Development), Brent Smith (C.F.B. Suffield), Brenda Dale (Environment Canada), Cleve Wershler (Sweetgrass Consultants Ltd.), Rob Wapple (Envirosearch Ltd), Nicole Firlotte (Manitoba Conservation), and Sue Peters, Paul Jones and Nyree Sharp (Alberta Conservation Association).

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INTRODUCTION

The sage thrasher (*Oreoscoptes montanus*) is a brownish-grey songbird of the Mimidae family that is just smaller than a robin (Godfrey 1986). As the only member of its genus, it is distinguished from the true thrashers (*Toxostoma* spp.) by its smaller size and shorter straight bill (Reynolds et al. 1999, Sibley 2000). It breeds in the big sagebrush shrub-steppe habitats and hillside thickets from south-central British Columbia, central Idaho, and south-central Montana south through the Great Basin to eastern California, northeastern Arizona, and northwestern New Mexico (Reynolds et al. 1999). It also breeds at least irregularly in southeastern Alberta and southwestern Saskatchewan (Salt and Salt 1976, Semenchuk 1992, Smith 1996, Cannings 2000). The sage thrasher winters from southern Nevada, central Arizona, central New Mexico and west-central Texas south to central Mexico and Baja California (Reynolds et al. 1999).

The sage thrasher is widely distributed but may be starting to decline throughout its North American range as shown by Breeding Bird Survey (BBS) data. In Alberta, the status of the sage thrasher has been considered *Undetermined* since 1996 because of a lack of information on the species (Alberta Environmental Protection 1996, Alberta Sustainable Resource Development 2001a).

This report is intended to compile and summarize all current information on sage thrasher for the purpose of updating the status of the species in Alberta.

HABITAT

The sage thrasher is considered a sagebrush (*Artemisia* spp.) obligate (Reynolds et al. 1999). It is found in shrub-steppe communities of the Great Basin primarily in arid or semi-arid situations (Braun et al. 1976, Campbell et al. 1997, American Ornithologists' Union 1998). It prefers areas dominated by big sagebrush (*A. tridentata*), but has also been found in other similar habitats such as greasewood (*Sarcobatus vermiculatus*) and antelope-brush (*Purshia tridentata*) (Reynolds et al. 1999). In its wintering range, the sage thrasher occupies arid and semi-arid scrub, brush and thickets (American Ornithologists' Union 1998).

In the Columbia Basin and the northern Great Basin, the sage thrasher's abundance has been found to correlate positively with the amount of sagebrush cover, percent shrub cover, percent bare ground cover and several indices relating to horizontal heterogeneity, and to correlate negatively with percent grass cover and percent cover of both annual grass and Sandberg's bluegrass (*Poa sandbergii*) (Rotenberry and Wiens 1980, Dobler et al. 1996, Reynolds et al. 1999, Vander Haegen et al. 2000). The abundance of the sage thrasher was greater on loamy and shallow soils than on sandy soils (Vander Haegen et al. 2000). Where adequate shrub cover existed, abundance was correlated with perennial grass understory (Reynolds et al. 1999). The probability of site occupancy increased with sagebrush cover, total shrub cover, shrub patch size, decreased disturbance, and similarity of habitat within a 1-km radius (Knick and Rotenberry 1995). In Washington shrub-steppe, use of "good" (> 50% cover of climax species) or "fair" (25-50% cover of climax species) quality range classes was greater than the "poor" quality ones (< 25% cover of climax species; Vander Haegen et al. 2000). In British Columbia, breeding habitat was similar to nonbreeding habitat and was located in areas of rangeland characterized by low annual rainfall and a long history of overgrazing (Campbell et al. 1997).

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* See Appendix 1 for definitions of selected status designations.

Breeding individuals tend to choose larger than average shrubs in which to build nests (Petersen and Best 1991, Campbell et al. 1997, Cannings 2000). In British Columbia, these averaged 132 cm ± 32 (one SD; n = 19) in height and 168 cm ± 58 (one SD; n = 19) in width (Campbell et al. 1997; W. Easten, pers. comm.). However, a mean shrub height of only 90 cm for branch nests, and a mean as low as 69 cm for ground nests have been recorded in southeastern and south-central Idaho (Reynolds and Rich 1978, Rich 1980, Reynolds 1981). The amount of cover above the nest may be more important in determining suitable nesting shrubs than the actual height of the shrub. This cover provides important protection from predation (Reynolds et al. 1999). In Idaho, the distance between the top of the nest and the top of the bush was much the same whether the nest was on the ground or above ground (Reynolds and Rich 1978). This distance was 66 cm ± 16 (one SD; n = 34) in Idaho and at least 53 cm in British Columbia (Reynolds and Rich 1978, Campbell et al. 1997).

Unlike in British Columbia, big sagebrush (*A. tridentata*) is rare (Alberta Natural Heritage Information rank = S2) in Alberta and occurs only in the southwest part of the province (K. Vujnovic, pers. comm.). The shorter silver sagebrush (*A. cana*) is a dominant low shrub in the Dry Mixedgrass Natural Subregion of Alberta (Achuff 1994), where the sage thrasher has been observed nesting. Aldridge and Brigham (2002) found that the greater sage-grouse (*Centrocercus urophasianus*), another sagebrush-associated species, selected sagebrush taller than that found at random sites for nesting in southeastern Alberta. Those selected sagebrush averaged 41.3 cm ± 3.78 (one SE; n = 29) in height, which is less than what has been observed for nesting sage thrashers in Idaho and British Columbia (see previous paragraph). However, C. Aldridge (pers. comm.) indicated that even taller (60-70 cm and up to over 1 m) and thicker sagebrush is found in riparian situations, along creeks and in coulees. Those habitats are likely most suitable for nesting sage thrashers.

Nesting habitat in Alberta has been described as flat grassland valley scattered with sagebrush, where some thicker sage stands and other shrubs grow in low-lying areas (A. Smith, unpubl. data; Provincial Museum of Alberta, unpubl. data; R. Klauke, pers. comm.). One nesting site was in a previously disturbed area that included dikes, a windbreak and an old baseball diamond. The habitat at that site was a small dry shrubby creek bed running through part of a valley floor scattered with shorter sagebrush (O'Shea 1988, C. Wershler, pers. comm.).

Salt and Salt (1976), R. Klauke (pers. comm.) and C. Wershler (pers. comm.) believe that apparently suitable breeding habitat exists in Alberta, especially in the extreme southeast portion of the province where sagebrush dominates and much of the habitat is unexplored or largely inaccessible. Sagebrush grasslands are also found on Canadian Forces Base (CFB) Suffield, especially on loamy soil along the South Saskatchewan River, but also on sandy soil, and may provide suitable habitat for this species (B. Smith, pers. comm., C. Aldridge, pers. comm.). However, sage thrashers were not found during point count surveys conducted by the Canadian Wildlife Service within CFB Suffield in 1994-1995, as well as in 2000 and 2003 (B. Dale, pers. comm.). B. Dale (pers. comm.) felt that the sagebrush in CFB Suffield might be too small (<1 m) for the sage thrasher, but thick stands exist on some of the sandy areas (C. Aldridge, pers. comm.).

Much of southeastern Alberta is composed of large tracts of relatively unfragmented public native rangeland with limited road access (derived from Alberta Sustainable Resource Development 2001b, 2002). Mapping of sagebrush from interpretation of low solar

angle aerial photos (Fent 1999) has been completed for 42 townships in the extreme southeastern corner of Alberta for greater sage-grouse research and management purposes (P. Jones, pers. comm.). Large patches of mixed-height sagebrush can be found throughout the area, and narrow bands of tall (>1 m) sagebrush are present in coulees or in riparian areas (Figure 1). The tallest shrubs appear to be found in areas of lower sagebrush density, whereas the densest patches of sagebrush are of mixed or low height (Figure 2). The mixed-height patches, especially those near riparian areas, may thus offer the most suitable habitats for the sage thrasher, based on its habitat preferences in other parts of its breeding range. However, shrub-steppe habitat in the Columbia Basin and the northern Great Basin may differ significantly from that of the mixedgrass prairies of southeastern Alberta.

Oil and gas development is contributing to the fragmentation and reduction of suitable sagebrush habitat in southeastern Alberta, in addition to increasing vehicular traffic. Braun et al. (2002) indicated that, out of approximately 1500 wells that have been drilled so far within the current range of sage-grouse in Alberta, an estimated 575 are still producing, giving one active and two inactive well sites/km^2. Each of these well sites is connected by a series of trails and roads, power lines and pipelines that are interlaced with compressor stations and gas camps. Braun et al. (2002) attributed the 86% decrease in sage-grouse males displaying at lek sites in the mid-1980s and early 1990s in Alberta to booms in oil and gas development during this period. Further oil and gas development is expected for the area (Braun et al. 2002). A Northern Mixed Grass Multi-site Conservation Planning Initiative is currently being carried out among conservation stakeholders in Alberta, Saskatchewan, and the United States. As part of this initiative, GIS map analyses will be conducted to demonstrate the level of fragmentation caused by roads and oil and gas development in southeastern Alberta, southwestern Saskatchewan, and north-central Montana. The data will be available in April 2004 (K. Smith-Fargey, pers. comm.).

Habitat fragmentation does not appear to directly affect sage thrashers' abundance but may have a negative effect on their productivity. In Washington, sage thrashers did not appear to be area-limited and were frequently found nesting in small shrub-steppe fragments (<10 ha) in an agricultural matrix (Vander Haegen et al. 2000). However, the risk of nest depredation was nine times higher in fragmented landscapes than in continuous landscapes (Vander Haegen et al. 2002). In Idaho, sage thrashers were more likely to return to sites that had large patch sizes, high sagebrush cover, low disturbance and high habitat similarity within a 1-km radius (Knick and Rotenberry 1995). No sage thrashers fledged from fragmented habitat, even though the species' abundance between fragmented and unfragmented habitats did not differ (Schoeberl 2003). Fragmented habitats may act as sinks, whereas contiguous habitats function as sources because of differences in productivity (Schoeberl 2003).

CONSERVATION BIOLOGY

1. Species Description -- The sage thrasher is a medium-sized (length 20.0-23.0 cm, mass 39.6-50.3 g) songbird with a relatively shorter tail, and straighter and shorter bill than the other North American thrashers (Reynolds et al. 1999). Males are slightly larger than females, but both sexes have similar plumage. Adults have brownish-grey upperparts with indistinct dusky streaks, except in very worn adult plumage where streaking can be obscure (Sibley 2000). Wings have two narrow whitish bars and darker plumage than that on the back. The tail is dark greyish-brown, with the outer feathers broadly tipped with white.

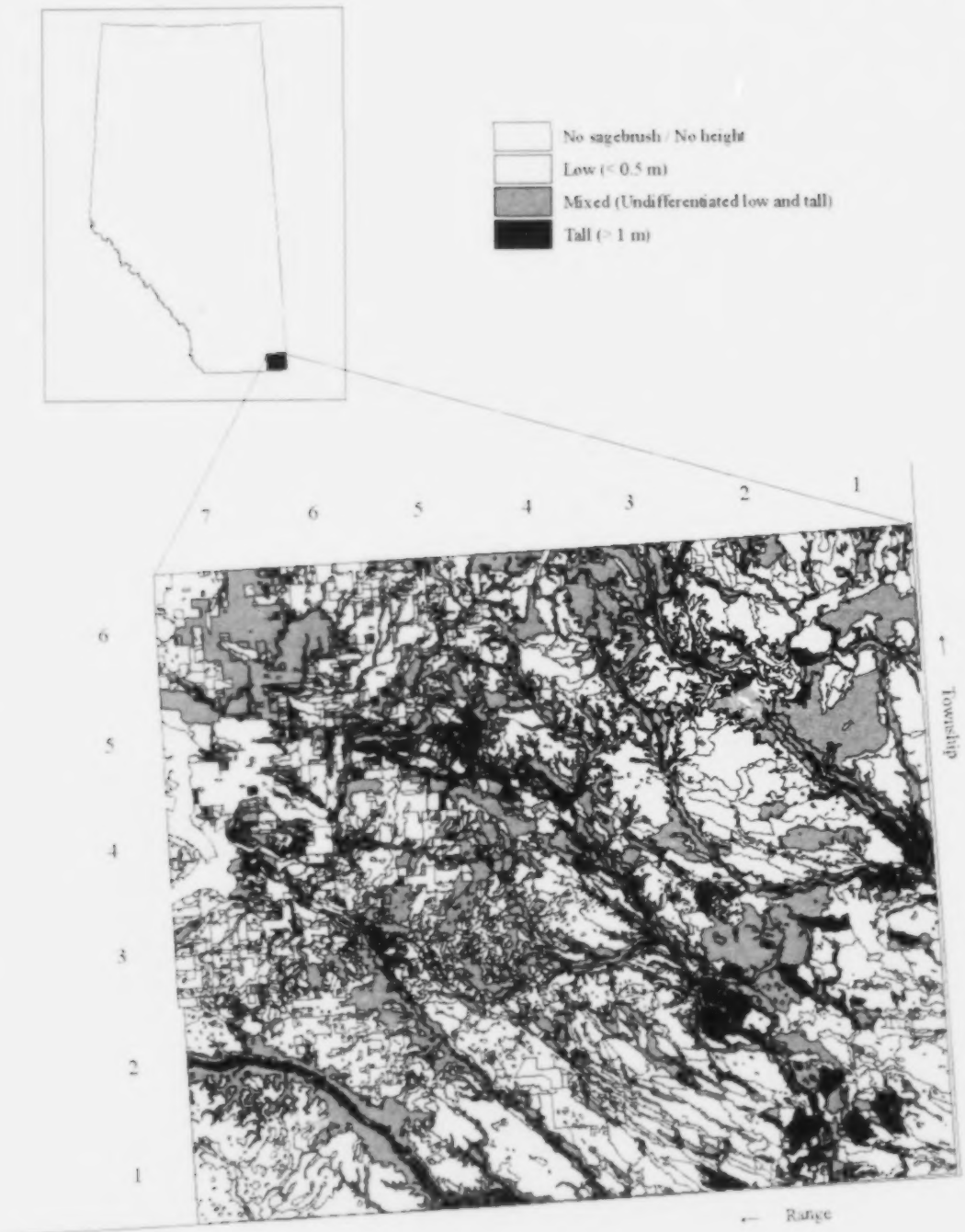

Figure 1. Relative sagebrush height, as determined from low solar angle aerial photo interpretation, in the southeastern corner of Alberta. (Data provided by Alberta Conservation Association, Southern Alberta Business Unit.)

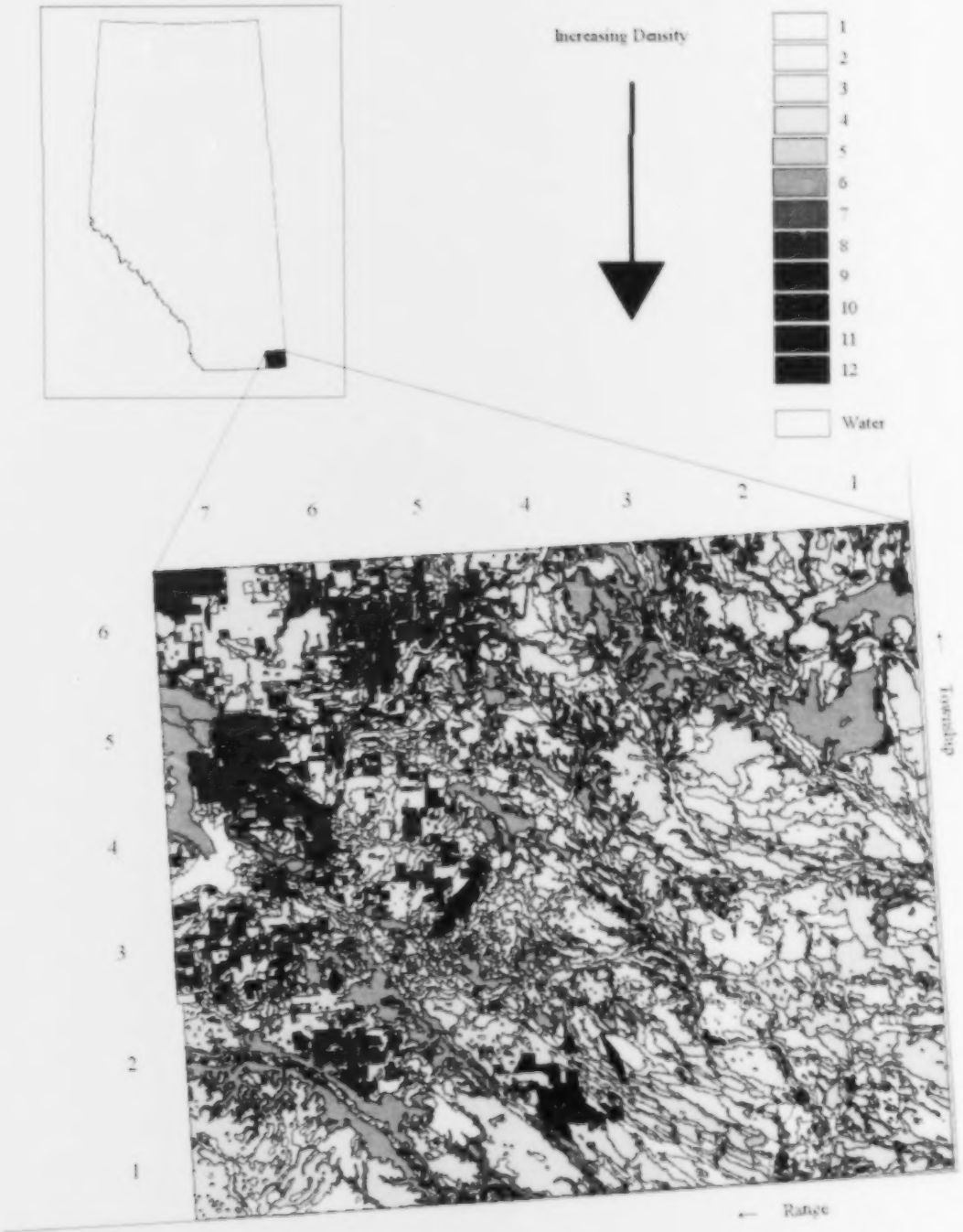

Figure 2. Relative sagebrush density, as determined from low solar angle aerial photo interpretation, in the southeastern corner of Alberta. Density classes vary from "1", rare, to "12", dense and continuous sagebrush cover. (Data provided by Alberta Conservation Association, Southern Alberta Business Unit.)

Underparts are buffy-white, boldly streaked with dark brown. Eyes are yellow to amber in colour (Reynolds et al. 1999). The song is a "run-on warble of mellow, rolling or churring whistles with changeable tempo but very little pitch change" (Sibley 2000).

2. Food Habits -- Although no information is available about the food habits of the sage thrasher in Alberta, it is known to be an opportunistic feeder, feeding mainly on ground beetles, grasshoppers, crickets, caterpillars and ants, but also seeds, berries and other small fruit as available (Reynolds et al. 1999), and possibly eggs from other nests (Vander Haegen et al. 2002). After the breeding season and throughout the winter, sage thrashers consume arthropods, caterpillars, fruits, mistletoe (*Phoradendron* spp.) and other berries (Rosenberg et al. 1991, Stepniewski 1999).

3. Breeding -- Sage thrashers nest most commonly in sagebrush (*Artemisia* spp.; Reynolds et al. 1999, Cannings 2000), but have also nested in other shrubs such as greasewood (*Sarcobatus vermiculatus*), rabbitbrush (*Chrysothamnus* spp.), wild rose (*Rosa* spp.), saskatoon (*Amelanchier alnifolia*), hawthorn (*Crataegus* spp.), peach (*Prunus* spp.), and occasionally, on the ground (Gilman 1907, Potter 1937, Reynolds and Rich 1978, Reynolds 1981, Campbell et al. 1997, Reynolds et al. 1999). One nest described in Alberta was built at least 1 m high in a *Shepherdia* sp. (buffaloberry) bush (D. Baresco, pers. comm. in Cannings 1992). Another one was located on the ground under a sagebrush shrub (O'Shea 1988).

Sage thrashers breed in their first year after hatching (Reynolds et al. 1999). Clutch sizes vary between one and seven eggs, but are typically between four and five eggs across the range of the species (Reynolds et al. 1999). No nests have been reported prior to hatching stage in Alberta and two nests reported each contained a total of three young (O'Shea 1988, Baresco 1989). No information is available about the incubation and nestling periods in Alberta. In Idaho and Oregon, incubation was found to vary between 11 and 17 days and young were capable of leaving the nest by 10-11 days (Reynolds et al. 1999).

Sage thrashers are monogamous and both males and females build the nest, incubate the eggs, and attend the young (Reynolds et al. 1999, Cannings 2000). Very little information is available about nesting success, and none is available about post-breeding dispersal in Alberta. One fledgling was observed in the general area of a nest in 1988, indicating that at least some young survive to fledging (O'Shea 1988).

4. Phenology -- The phenology of this species in Alberta is very sketchy. The earliest sage thrasher sighting reported in the province was on 11 May 1995 (Alberta Birdlist; Rare Bird Report; FAN unpubl. data). The first singing bird was recorded on 15 May 1992 (C. Wershler, pers. comm.). The first female recorded was on 23 May 1957 (Hohn et al. 1958, Salt and Wilk 1966). In British Columbia, Cannings (2000) mentions that the bulk of the breeding population does not arrive until the end of May, and 82.3% of the records were on 1 June or later. He also speculated that several birds nesting in British Columbia might be failed breeders from Washington, which would explain their late arrival (Cannings 2000).

In Alberta, the first nest ever recorded was likely at or near the nestling stage when a pair was first observed on 8 July. The pair was observed carrying food on subsequent days and the actual nest containing three "fairly large" nestlings was found on 17 July (O'Shea 1988, Alberta Bird Record Committee, unpubl. data). A fledgling was last seen at that site 3 August (O'Shea 1988). Fledged young generally remain in the vicinity of the nest for

about a week after fledging (Reynolds et al. 1999). In British Columbia, the earliest recorded egg laid was 28 May (Reynolds 1999). In Montana, a fledgling was observed just out of the nest on 30 July (Montana Natural Heritage Program 2003).

Sage thrashers are migratory (American Ornithologists' Union 1998). The latest record of this species in Alberta was a group of at least four birds on 5 September 2003 (D. Baresco, pers. comm.). No information is available about the duration, route or chronology of migration, or about the location of the wintering grounds for the Alberta birds. In British Columbia, sage thrashers leave at the end of August and September, and the latest record was a group of five birds on 29 September 1991 (Cannings 2000).

5. Longevity -- No information is available about the longevity of the sage thrasher. Of the 1143 birds banded throughout this species' range until 2002, no band recovery was reported to the North American Bird Banding Program, which is jointly administered by the Canadian Wildlife Service and the United States Department of the Interior (Gustafson and Hildenbrand 2002). However, other mimids have been recorded to live between five years and eleven months (gray catbird; *Dumetella carolinensis*) to seven years and nine months (brown thrasher; *Toxostoma rufum*; Brewer et al. 2000).

DISTRIBUTION

1. Alberta -- Sage thrashers have been found primarily in southeastern Alberta, but scattered records exist throughout south and west-central Alberta up to near Grande Prairie (Figure 3). The first sage thrasher recorded in Alberta was a single bird seen near Orion in 1924 (Salt and Wilk 1966). A male was collected near Walsh on 15 June 1940 (Jones 1956), an adult female was collected at Springbank on 23 May 1957 (Hohn et al. 1958), and one bird was seen near Drumheller on 30 August 1958 (Hohn et al. 1958, 1959, Salt and Wilk 1966, Semenchuk 1992). One bird was seen south of Cypress Hills in the 1960s (A.R. Smith, unpubl. data). The sighting was made by two competent ornithologists, but was never reported to the Provincial Museum of Alberta (A. Smith, pers. comm.; Sadler and Myres 1976; Pinel et al. 1993). Transient birds have been reported as far north as Cutbank Lake (20 May 1985), northwest of Grande Prairie on the edge of the Peace River Parkland Natural Subregion, and south of Jasper town (11 May 1995) in the Montane Natural Subregion (Alberta Bird Record Committee, unpubl. data). It can be speculated that these sightings represent overshoots from the British Columbia sage thrasher population (H. Pinel, pers. comm.)

The sage thrasher has been recorded breeding locally in the Mixedgrass and Dry Mixedgrass natural subregions (Achuff 1994). It has been confirmed breeding irregularly south of Medicine Hat (1988-1991; Gollop 1988, R. Klauke, pers. comm.; Alberta Bird Record Committee, unpubl. data), east of Manyberries (1989; Semenchuk 1992, Federation of Alberta Naturalists, unpubl. data; Alberta Bird Record Committee, unpubl. data), and southeast of Manyberries (2003; Alberta Bird Record Committee, unpubl. data) (Figure 3). The species probably (at least one pair seen in suitable habitat) bred south of Medicine Hat in 1992 and southeast of Manyberries in 2002, and possibly (singing male in suitable habitat) bred southeast of Manyberries in 2003 and south of Medicine Hat in 1993. A singing male was also observed near Bruce Lake in the Foothills Fescue Natural Subregion (1986; Gollop 1986), and another was photographed south of Brooks in the Dry Mixedgrass Natural Subregion on16 June 1999 (Alberta Bird Record Card, Provincial Museum of Alberta, unpubl. data; Alberta Bird Record Committee, unpubl. data).

Figure 3. Distribution of sage thrasher sightings in Alberta. (Confirmed breeding records are those that showed direct breeding activities. Possible breeding records are those where singing males were observed in suitable habitat. Nonbreeding records include those of transient or migrant birds or those of birds of unknown breeding status.)

It is unknown whether the sage thrasher nested in Alberta before 1988. O'Shea mentioned that very few ornithologists and bird watchers visited the area south of Medicine Hat before the start of the first Alberta Bird Atlas Project in 1987 (O'Shea 1988, Semenchuk 1992, Cannings 1992). However, C. Wallis, W. Smith, R. Wershler and C. Wershler have conducted field studies in sagebrush areas throughout the wild portions of southeastern Alberta for extended periods over the last three decades and have never encountered sage thrashers during their studies, despite searching for them (C. Wershler, pers. comm.). The Alberta Bird Atlas Project, coordinated by the Federation of Alberta Naturalists, has resulted in increased opportunities to detect this species in the province. Although much of southeastern Alberta was surveyed during the five years of the first Bird Atlas Project (1987-1992), limited road access in the extreme southeast may have prevented complete coverage (P. Penner, pers.comm.).

The Canadian Wildlife Service conducted a sage thrasher survey during the summer of 2003 in southeastern Alberta and southwestern Saskatchewan. Current and historical record sites and apparently suitable areas were surveyed but no sage thrashers were detected in either province (A. Smith, pers. comm.). The details of this survey were not available at the time of this report, but A. Smith (pers. comm.) mentioned that invasion of sweetclover (*Melilotus* spp.) and tall grass on rangeland, following above-normal precipitation for the summer of 2002 in southeastern Alberta and a moist spring in 2003, may have negatively affected some areas for this species that prefers bare ground and avoids dense grass cover. However, some areas were still suitable as one pair was later confirmed nesting at a previously known site southeast of Manyberries (Alberta Bird Record Committee, unpubl. data).

Based on all known and possible nesting locations (Figure 3), the extent of occurrence of this species in the province was estimated at 1518 km^2 (one possible site near Bruce Lake was excluded from the calculation owing to its location in agricultural land [Alberta Bird Record Card; Provincial Museum of Alberta, unpubl. data] and its discontinuity from grassland habitat). The area of occupancy was estimated at 16 km^2 (based on a 2 km x 2 km grid), or 1% of the extent of occurrence.

2. Other Areas -- Breeding of sage thrashers in Saskatchewan is restricted to the extreme southwest of the province, near Frenchman River and Battle Creek (Smith 1996; Figure 4). Numbers have greatly fluctuated over time and there has not been any confirmed breeding in Saskatchewan since 1982 (Smith 1996; A.R. Smith, unpubl. data).

In Montana, the nearest confirmed breeding site is southeast of Helena (derived from Montana Bird Distribution Online Database 2001), or about 340 km south of the southernmost breeding location in Alberta. The bulk of the known breeding population in Montana is found south of Butte, or at least 400 km away from the southernmost breeding site in Alberta. No information is available about the ability of this species to disperse to other breeding areas. A potential breeder was recorded southwest of Malta, MT in 1993, or about 220 km away from the Alberta sites (derived from Montana Bird Distribution Online Database 2001). The species also seems scarce in this area, even though there is extensive sagebrush habitat (C. Wershler, pers. comm.). However, tall sagebrush in Montana appeared highly fragmented in terms of ratio of percent of land cover containing tall sagebrush to the amount of perimeter with other habitats (Knick et al. 2003).

In British Columbia, the sage thrasher breeds regularly in the southern Similkameen and Okanagan valleys (Godfrey 1986, Cannings 1995, Cannings 2000). Cannings (2000)

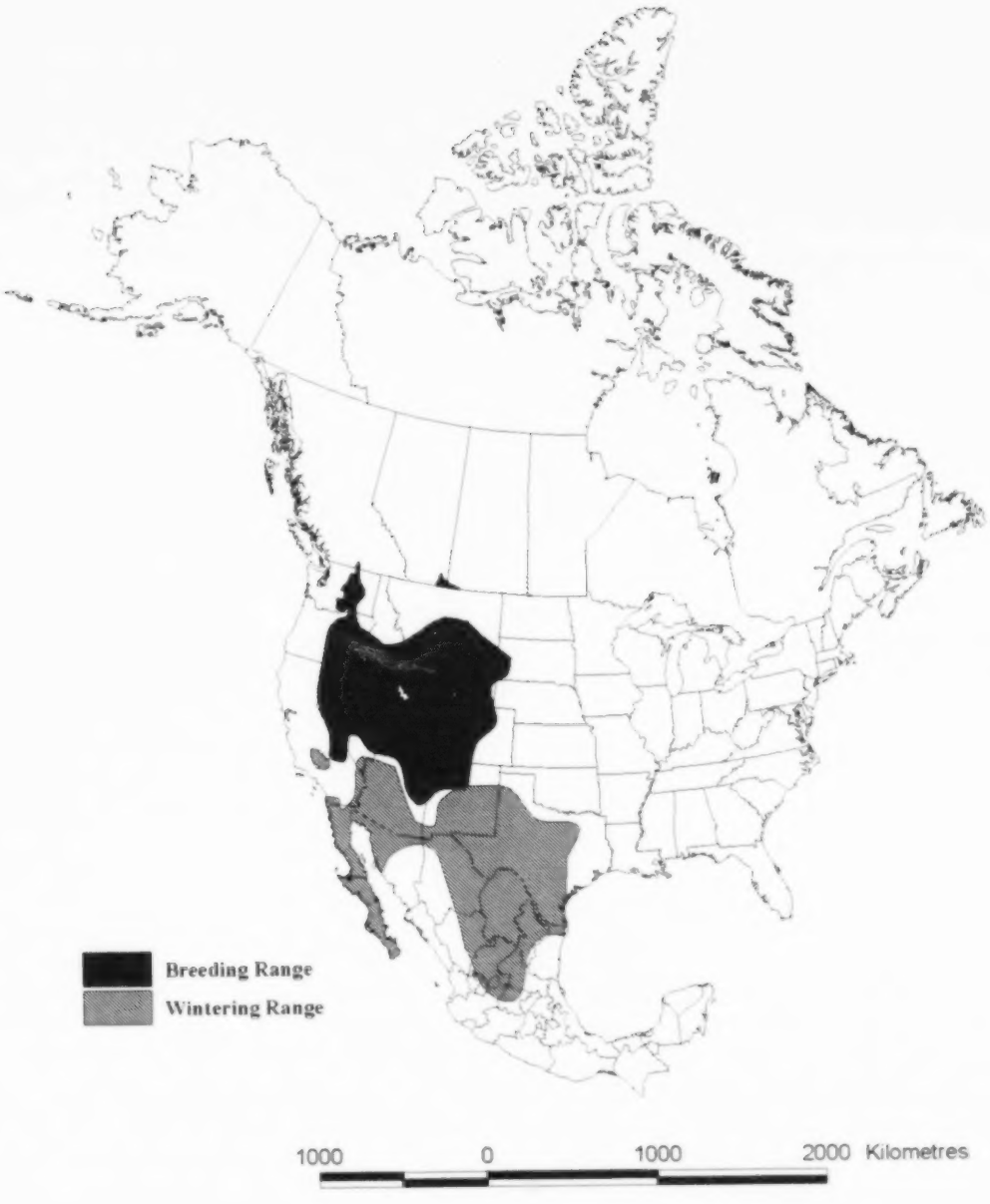

Figure 4. North American range of the sage thrasher (adapted from Reynolds et al. 1999, Cannings 2002, Ridgely et al. 2003, Vander Haegen 2003).

suggested that nesting individuals in British Columbia may be birds from Washington that first attempted breeding in early May and moved north after their nests failed. A similar situation could be happening between the core breeding population in Montana and the birds that nest in Alberta. However, if Alberta breeding birds originated in Montana, their general nesting area in the province is much further removed from the Montana core nesting area (over 400 km) than is the one between British Columbia and Washington. R. Cannings (pers. comm.) indicated that sagebrush habitat was relatively continuous from the Columbia Plateau in Washington up into the Okanagan Valley in British Columbia, and that the closest nesting site in Washington was no more than 10 km away from the southernmost ones in British Columbia.

According to Cannings (2000), little change has occurred in the past decade with regards to the Canadian distribution of sage thrashers. Elsewhere, the species breeds in east-central Washington, southern Idaho east to southern and central Montana and south through the Great Basin to northern Arizona and northwestern New Mexico (American Ornithologists' Union 1998, Reynolds et al. 1999). It is unknown where the Alberta population of sage thrashers overwinters. In general, the species winters from extreme south and southeastern California, southern Nevada, central Arizona, central New Mexico and west-central Texas south into interior Mexico to Durango, Guanajuato, and northern Tamaulipas, and west through Sonora and into Baja California, and occasionally in central California (American Ornithologists' Union 1998, Reynolds et al. 1999).

POPULATION SIZE AND TRENDS

1. Alberta -- The sage thrasher in Alberta is at the northern limit of its range and, as a result, its numbers in the province appear to vary greatly from year to year (Figure 5). Since 1988, when the species was first confirmed as breeding in the province, reported numbers have varied annually from 0-3 breeding pairs. These variations may also reflect a highly variable search effort from volunteer birders and biologists. The sage thrasher was never detected during Breeding Bird Surveys in Alberta from 1966 to 2002 (USGS Patuxent Wildlife Research Center 2003). This most certainly indicates low numbers in the province, but may also reflect the time of the year at which the surveys were conducted, and the difficulty in detecting them (Cannings et al. 1987). Cannings (2000) suggested that breeding birds in British Columbia might be failed breeders from Washington to explain the late arrival of many sage thrashers. If a similar pattern occurs in Alberta, late-arriving birds might be missed by an early survey. Because of these variations and low numbers, it is not possible to detect a trend in population numbers (Cannings 2000).

The Alberta Bird Atlas Project, the only other organized survey in southeastern Alberta prior to 2003, was first conducted between 1987 and 1992, and another was started in 2000 and will end in 2005. Lower numbers of sage thrashers in the province from 1993 to 2001 also correspond to a gap in Bird Atlas surveys during much of that period. No sage thrashers were detected during an extensive sage thrasher survey conducted by the Canadian Wildlife Service throughout much of southeastern Alberta and southwestern Saskatchewan during the summer of 2003 (A. Smith, pers. comm.). Extensive areas in the extreme southeastern portion of Alberta are largely inaccessible and could contain additional birds. Therefore, the number of sage thrashers in the province is difficult to determine. It is apparent that there are only a few breeding birds each year if any. Cannings (1992) estimated the population in Alberta and Saskatchewan at less than 10 pairs.

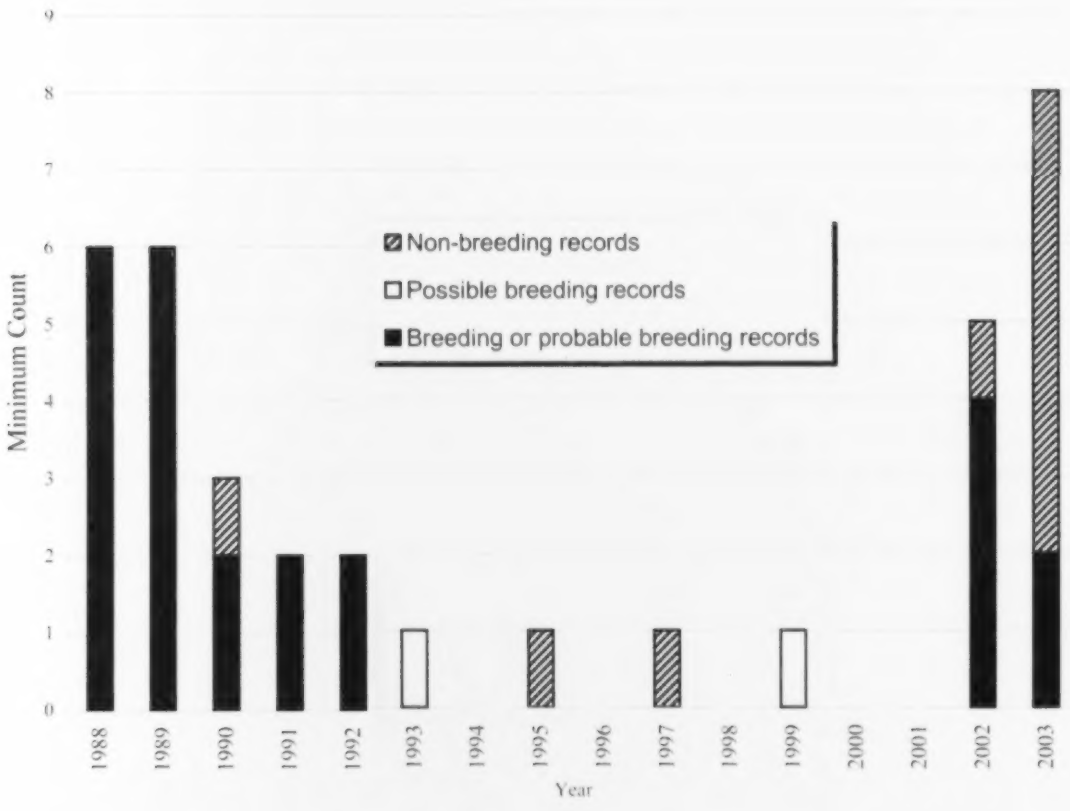

Figure 5. Minimum number of adult sage thrashers reported in Alberta since 1988. (Breeding and probable breeding records are those that show direct or indirect evidence of breeding. Possible breeding records are those where singing males were observed in suitable habitat. Nonbreeding records include those of transient or migrant birds or those of birds of unknown breeding status.)

2. Other Areas -- The sage thrasher in Saskatchewan has been reported erratically as breeding and its population is too small to detect any trend (Smith 1996, Cannings 2000). In British Columbia, the spring population was historically as high as 30 or more pairs, but recent maximum numbers range between 5 and 12 pairs (Cannings 2000). Cannings (2000) reported the loss of two breeding sites to agriculture and housing, contributing to the decreased numbers. Only one individual was detected (in 2000) during Breeding Bird Surveys from 1966 to 2002 (USGS Patuxent Wildlife Research Center 2003).

According to D. Casey (pers. comm.), sage thrashers are very abundant in southwestern and central Montana, where the best sagebrush habitat occurs. Although no population numbers are known and no systematic surveys have been conducted other than BBS (J. Carlson, pers. comm.), there are concerns that the decreasing numbers of other sagebrush obligates such as the greater sage-grouse and Brewer's sparrow (*Spizella breweri*) (D. Casey, pers. comm.) may be linked to some factor that would also affect sage thrashers.

Breeding Bird Survey data from across the range of the sage thrasher and for the entire

survey period of 1966 to 2002 showed a survey-wide nonsignificant decrease of 0.6% per annum ($p = 0.21$; $n = 310$ routes) where the species could be detected (Sauer et al. 2003). In Montana, a nonsignificant ($p = 0.72$) decrease of 0.67% per annum was also detected for the same time period, but the number of routes surveyed was small ($n = 16$). The decrease in sage thrasher populations appears to be recent. Data for the period of 1966 to 1991 indicate an increase of 0.58% per annum across the sage thrasher's range, whereas in Montana, a small nonsignificant decrease ($p = 0.90$; $n = 13$) of 0.34% per annum was observed. However, data for the period of 1992 to 2002 indicated a highly significant decrease of 2.8% per annum ($p = 0.000$; $n = 268$ routes) across the range of the species, and a nonsignificant ($p = 0.19$) decrease of 16.83% per annum in Montana, detected from a low number ($n = 9$) of routes.

LIMITING FACTORS

As a sagebrush steppe specialist, the sage thrasher's most important limiting factors relate to degradation, fragmentation or loss of sagebrush habitat (Cannings 2000). In British Columbia and other areas of the species' range, sage thrasher habitat has been lost to residential development and agricultural conversion, or has been degraded by range management practices such as mowing, burning, removal of shrubs, herbicide and pesticide applications, and by heavy grazing (Castrale 1982, Cannings 1992, Kerley and Anderson 1995, Reynolds et al. 1999). It is not known to what extent this applies to Alberta. Cannings (2000) mentions that large areas of Alberta sage thrasher habitat have been lost to agricultural development of irrigated farmland, but no information was provided about the timing of this loss with respect to the first record of nesting sage thrashers or about the area to which the author was referring. However, much of the land in the current known breeding range of the sage thrasher in Alberta is under both private and public ownership and is used as rangeland for cattle grazing (Alberta Sustainable Resource Development 2002). It can also be inferred from information on the decline of the greater sage-grouse that at least some sagebrush grasslands have been converted to agriculture or fragmented by oil and gas exploration and extraction, resulting in habitat loss and degradation for the two species (Aldridge 1998, Braun et al. 2002; see also discussion on habitat fragmentation in "Habitat" section). The extent of tall sagebrush habitat in Montana also appears to be highly fragmented (see Knick et al. 2003) and may explain the recent decrease in sage thrasher populations in that state, as indicated by recent Breeding Bird Survey results (Sauer et al. 2003), and the known decrease in other sagebrush obligates (D. Casey, pers. comm.). Sagebrush habitat loss and degradation in Montana and Alberta and the distance from the core breeding population in Montana may both hinder the capability of this population to expand into Alberta and colonize remaining suitable sagebrush habitats.

It is not known whether current grazing regimes in southeastern Alberta are affecting sagebrush communities or whether the physical destruction of sagebrush by cattle is significant, but both have been mentioned as possible threats to sage thrasher habitat in Canada (Cannings 1992).

Changes in moisture regime can also limit sage thrasher habitat in Alberta. Following a wet spring in 2003 in southeastern Alberta, A. Smith (pers. comm.) noted an abundance of sweetclover and tall grass in areas that would otherwise be suitable for the sage thrasher, which prefers bare ground and avoids dense grass cover (Rotenberry and Wiens 1980).

Harassment during territory establishment and predation on nestlings by the sympatric loggerhead shrike (*Lanius ludovicianus*) has

had a negative effect on a southeastern Idaho population of sage thrashers (Reynolds 1979). This could potentially be a factor limiting reproductive success in Alberta, but it has not yet been reported.

Direct human disturbance, especially during the breeding season, can also limit reproductive success of this species in the province. Baresco (1989) noted that the vegetation leading to a nest site south of Medicine Hat had been broken and trampled, and that the nest was exposed and empty on 22 June, indicating that the nest had failed.

Reynolds et al. (1999) mentioned that the effects of various stresses such as weather, habitat fragmentation and predation are often greater in marginal habitat—more often found at the edge of a species' breeding range, rather than in prime, core habitat—and may account for local or regional population trends. It is not known what the implications of climate change will be for the sage thrasher and sagebrush grasslands in Alberta or elsewhere. Climate change associated with both natural and anthropogenic factors is expected to result in an increased frequency, intensity and duration of droughts on the southern prairies of Canada (Lemmen et al. 1997, Leavitt and Chen 2001). There is growing evidence that some birds may already be responding to climate change by shifting their range further north (Price and Root 2002). Potter (1937) and M. O'Shea (1988, pers. comm.) suggested that the droughts of the 1930s and of 1988 might have created conditions favourable for the sage thrasher in Alberta and Saskatchewan or deteriorated its habitat further south in Montana, resulting in a northward spread of the species. If this holds true, climate change might actually favour the sage thrasher in Alberta through a northern shift in range. However, rangeland management practices may also change in response to changing vegetation patterns, potentially at the expense of sagebrush.

STATUS DESIGNATIONS

1. Alberta -- The sage thrasher is currently listed as a *Non-game Animal* by regulation under Alberta's *Wildlife Act* (Alberta Queen's Printer 2003). It was ranked as *Undetermined* under *The General Status of Alberta Wild Species 2000* because of a lack of information about the species in Alberta, and has had this status since 1996 (Alberta Environmental Protection 1996, Alberta Sustainable Resource Development 2001a). The sage thrasher was on the "Green List" in 1991 and considered accidental or peripheral to its distribution (Alberta Forestry, Lands and Wildlife 1991), and was listed as a "vagrant" species in 1985, and thus not considered for a status designation (Alberta Fish and Wildlife 1985). The Alberta Natural Heritage Information Centre (ANHIC) ranks this species as "SAB", i.e., accidental breeder in the province, because of a limited number of breeding occurrences (ANHIC 2003).

2. Other Areas. - The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) designated the sage thrasher as *Endangered* in Canada in 1992 (COSEWIC 2003a). Its status was re-assessed and confirmed in November 2000 based on an updated status report (COSEWIC 2003a). It was then listed by Order in Council as an *Endangered* species under Schedule 1 of Canada's *Species At Risk Act* (Government of Canada 2003).

In December 1996, NatureServe, the network of conservation data centres and natural heritage programs across Canada and the United States, gave this species a global heritage status rank of "G5"; i.e., demonstrably widespread, abundant and secure across its range (NatureServe 2003). This was based on a nonsignificant survey-wide increase from the North American Breeding Bird Survey, a survey-wide stable trend from the Audubon Christmas Bird Count, variable local trends, and threats such

as habitat loss and fragmentation (NatureServe 2003).

Conservation data centres and natural heritage programs from jurisdictions around Alberta have ranked the sage thrasher as "S2B" in Saskatchewan (Saskatchewan Conservation Data Centre 2003), as "S1B" in British Columbia (BC Species and Ecosystems Explorer 2003), "SNA" (nonbreeding and accidental or casual) in Manitoba (N. Firlotte, pers. comm.), and as "SU" (status uncertain) in Montana (Montana Natural Heritage Program 2003).

RECENT MANAGEMENT IN ALBERTA

The general status of the sage thrasher in Alberta is still considered *Undetermined* because insufficient information is available to reliably assess the species' status (Alberta Sustainable Resource Development 2001a). As a result, no management activities have been undertaken in Alberta targeting this species directly. A national recovery team has been created in order to reverse the threats to this species and ensure its long-term survival. The team is collaborating with a recovery program directed at the South Okanagan-Similkameen ecosystem and as such, it has focused solely on the British Columbia population (Environment Canada 2003). Mapping of sagebrush from interpretation of low solar angle aerial photos (Fent 1999) has been completed for 42 townships in the extreme southeastern corner of Alberta for greater sage-grouse research and management purposes (P. Jones, pers. comm.; Figures 1 and 2). This map could also be used to conduct further analyses on sage thrasher habitat and to determine potential breeding areas.

SYNTHESIS

The sage thrasher is a sagebrush shrub-steppe species that prefers areas of greater sagebrush cover, bare ground and sparse perennial grass cover on loamy shallow soils (Reynolds 1999). In Alberta, the species has been found in flat short-grass valleys or coulees where mixed-size sagebrush stands and other shrubs occur. Information about the distribution, population numbers, trends, habitat use, reproductive success and several aspects of the sage thrasher's biology in Alberta is either absent or anecdotal and very limited. Before 1988, only a few rare sightings were reported and likely represented transient birds (Salt and Salt 1976, Semenchuk 1992).

Since the first nest was discovered south of Medicine Hat in 1988, breeding has been confirmed at two other sites in the province. The current number of sage thrashers nesting in Alberta appears to be low and to vary from year to year. Breeding appears to be irregular and unpredictable, and likely reflects the fact that not only are Alberta sage thrashers at the northern edge of their North American range, they are disjunct from the main breeding areas, and are also difficult to detect (Cannings et al. 1987, Cannings 2000). However, no surveys directed at this species had been conducted prior to 2003. Incidental sightings have been reported by amateur birders. Field studies conducted by biologists in southeastern Alberta in the last three decades, as well as bird surveys conducted by the Canadian Wildlife Service at C.F.B. Suffield in 1994-1995 and 2000-2003 did not detect the species. In 2003, an extensive survey specifically targeting the species at known and potential breeding areas in southeastern Alberta and southwestern Saskatchewan did not detect any sage thrashers.

Breeding of sage thrashers in Alberta has been more frequent since 1988 and may be the species' response to changes in climatic

conditions (Potter 1937, O'Shea 1988), or may be an artefact of an increased interest by birders since the first nesting pair was observed and an increased presence of birders in southeastern Alberta through the Alberta Bird Atlas projects.

There are large areas of apparently suitable habitat in the extreme southeastern portion of Alberta and possibly at C.F.B. Suffield that remain largely unexplored or inaccessible and could harbour additional individuals. Many of the ranches in this area are over one township (9324 ha) in size and have limited road access (D. Eslinger, pers. comm.). However, this area of southeastern Alberta is disjunct from the main breeding population in Montana by more than 400 km and no information about the ability of this species to disperse to other areas is currently known. In addition, the apparent decrease in sage thrasher numbers in Montana, as indicated by Breeding Bird Survey data in recent years, may be limiting dispersal into Alberta. The tall sagebrush habitats where sage thrashers occur appear highly fragmented in Montana (see Knick et al. 2003), and may act synergistically with the above factors in decreasing the ability of this population to colonize southeastern Alberta. Activities relating to oil and gas exploration and extraction in southeastern Alberta may currently be the greatest threat to the habitat of this species in the province and may contribute to further isolation of it from the main breeding population in Montana.

Because this species is so uncommon in the province and difficult to detect, research priorities should be focused on assessing the current habitat at known and suspected nesting locations and gathering information on vegetation (species diversity, percent cover, shrub and grass height, etc.), associated wildlife species, topography, soils and moisture regime. Information about the impact of various land management practices (e.g., differential grazing regimes, controlled burns, etc.) as well as oil and gas development on sagebrush ecosystems in the province is also lacking. Conservation efforts should be targeted at ensuring that large tracts of sagebrush habitats remain in the province to sustain viable populations of sage thrashers and other sagebrush obligates. International initiatives, such as the Northern Mixed Grass Multi-site Conservation Planning Initiative, need to be pursued in order to ensure that sufficient quality sagebrush habitat remains and to prevent potential colonizing populations from decreasing. The sage thrasher is a species that might be positively affected by climate change in Alberta, and monitoring of the sagebrush ecosystems will assist in detecting trends in habitat availability for the sage thrasher. A banding program should also be initiated in the province where breeding is observed to help assess post-breeding dispersal and survival, and the level of recruitment in the province. Research on the sage thrasher could be conducted collaboratively with research on other sagebrush obligates such as the greater sage-grouse or the Brewer's sparrow, in order to optimize resource allocation for work on rare species.

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Appendix 1. Definitions of selected legal and protective designations.

A. The General Status of Alberta Wild Species 2000 (after Alberta Sustainable Resource Development 2001a)

2000 Rank	1996 Rank	Definitions
At Risk	Red	Any species known to be *At Risk* after formal detailed status assessment and designation as *Endangered* or *Threatened* in Alberta.
May Be At Risk	Blue	Any species that may be at risk of extinction or extirpation, and is therefore a candidate for detailed risk assessment.
Sensitive	Yellow	Any species that is not at risk of extinction or extirpation but may require special attention or protection to prevent it from becoming at risk.
Secure	Green	Any species that is not *At Risk, May Be At Risk* or *Sensitive*.
Undetermined	Status Undetermined	Any species for which insufficient information, knowledge or data is available to reliably evaluate its general status.
Not Assessed	n/a	Any species known or believed to be present but which has not yet been evaluated.
Exotic/Alien	n/a	Any species that has been introduced as a result of human activities.
Extirpated/Extinct	n/a	Any species no longer thought to be present in Alberta (*Extirpated*) or no longer believed to be present anywhere in the world (*Extinct*).
Accidental/Vagrant	n/a	Any species occurring infrequently and unpredictably in Alberta, i.e., outside its usual range.

B. Alberta Wildlife Act/Regulation

Species designated as *Endangered* under Alberta's *Wildlife Act* include those listed as *Endangered* or *Threatened* in the Wildlife Regulation.

Endangered	A species facing imminent extirpation or extinction.
Threatened	A species that is likely to become endangered if limiting factors are not reversed.

C. Committee on the Status of Endangered Wildlife in Canada (after COSEWIC 2003b)

Extinct	A species that no longer exists.
Extirpated	A species that no longer exists in the wild in Canada, but occurs elsewhere.
Endangered	A species facing imminent extirpation or extinction.
Threatened	A species that is likely to become endangered if limiting factors are not reversed.
Special Concern	A species of special concern because of characteristics that make it particularly sensitive to human activities or natural events.
Not at Risk	A species that has been evaluated and found to be not at risk.
Data Deficient	A species for which there is insufficient scientific information to support status designation.

Appendix 1 continued.

D. Heritage Status Ranks: Global (G), National (N), Sub-National (S) (after Alberta Natural Heritage Information Centre 2002)

G1/N1/S1	5 or fewer occurrences or only a few remaining individuals. May be especially vulnerable to extirpation because of some factor of its biology.
G2/N2/S2	6-20 or fewer occurrences or with many individuals in fewer locations. May be especially vulnerable to extirpation because of some factor of its biology.
G3/N3/S3	21-100 occurrences, may be rare and local throughout its range, or in a restricted range (may be abundant in some locations). May be susceptible to extirpation because of large-scale disturbances.
G4/N4/S4	Typically >100 occurrences. Apparently secure.
G5/N5/S5	Typically >100 occurrences. Demonstrably secure.
GX/NX/SX	Believed to be extinct or extirpated, historical records only.
GH/NH/SH	Historically known, may be relocated in future.
GR/NR/SR	Reported, but lacking in documentation

E. United States Endangered Species Act (after National Research Council 1995)

Endangered	Any species which is in danger of extinction throughout all or a significant portion of its range.
Threatened	Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

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